Pantograph

Kit contains:

- 2 Long cardboard strips
- 2 Short cardboard strips
- 4 Brass fasteners
- 1 Marker

You will need: a pencil, scratch paper, and a big piece of cadboard (Examples: part of a shipping box, poster board, or an unfolded cereal box).

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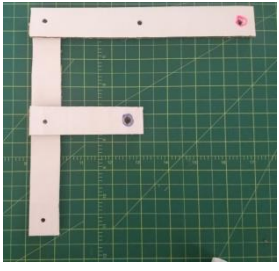
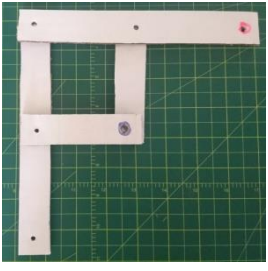
INSTRUCTIONS

Step 1. Place the cardboard strips as shown to form an F.

Step 2. Add the final short cardboard strip. Be sure the holes line up.

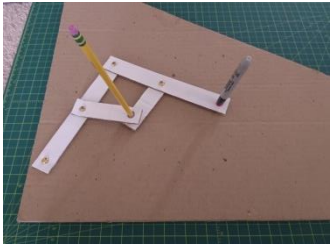




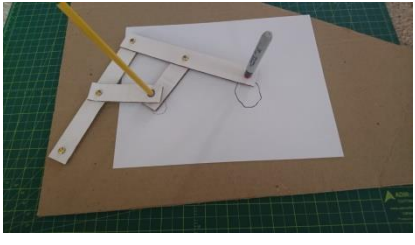
Step 3. Connect the holes with three of the brass fasteners.

Step 4. Punch a hole near the left edge of your big piece of cardboard. Attach your pantograph with the fourth fastener.

Step 5. Push your pencil into the overlapping blue holes. Push your marker into the pink one. This will require a bit of wigging, but it needs to be a tight fit.



Step 6. Place scratch paper under the pencil and marker. Draw with the pencil and see what your marker creates.



INVESTIGATE!

1. How does the marker drawing compare in shape to the pencil drawing?

2. How does the marker drawing compare in size to the pencil drawing?

3. What happens to the drawing if you swap the pencil and the marker?

4. What happens if you attach the blue intersection to the cardboard and put the pencil in the other long end?

5. Brain stretch: How could you build a pantograph in which the ratio of the marker drawing to the pencil drawing is even greater?